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The Theory of Planned Behavior

ICEK AJZEN

University of Massachusetts at Amherst

Research dealing with various aspects of' the theory of planned behavior (Ajzen, 1985, 1987) is reviewed, and some unresolved issues are discussed. In broad terms, the theory is found to be well supported by empirical evidence. Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; and these intentions, together with perceptions of behavioral control, account for considerable variance in actual behavior. Attitudes, subjective norms, and perceived behavioral control are shown to be related to appropriate sets of salient behavioral, normative, and control beliefs about the behavior, but the exact nature of these relations is still uncertain. Expectancy— value formulations are found to be only partly successful in dealing with these relations. Optimal rescaling of expectancy and value measures is offered as a means of dealing with measurement limitations. Finally, inclusion of past behavior in the prediction equation is shown to provide a means of testing the theory's sufficiency, another issue that remains unresolved. The limited available evidence concerning this question shows that the theory is predicting behavior quite well in comparison to the ceiling imposed by behavioral reliability.

As every student of psychology knows, explaining human behavior in all its complexity is a difficult task. It can be approached at many levels, from concern with physiological processes at one extreme to concentration on social institutions at the other. Social and personality psychologists have tended to focus on an intermediate level, the fully functioning individual whose processing of available information mediates the effects of biological and environmental factors on behavior. Concepts referring to behavioral dispositions, such as social attitude and personality trait, have played an important role in these attempts to predict and explain human behavior (see Ajzen, 1988; Campbell, 1963; Sherman & Fazio, 1983). Various theoretical frameworks have been proposed to deal with the psychological processes involved. This special edition of *Organizational Behavior and Human Decision Processes* concentrates on cogni-

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tive self-regulation as an important aspect of human behavior. In the pages below I deal with cognitive self-regulation in the context of a dispositional approach to the prediction of behavior. A brief examination of past efforts at using measures of behavioral dispositions to predict behavior is followed by presentation of a theoretical model—the theory of planned behavior—in which cognitive self-regulation plays an important part. Recent research findings concerning various aspects of the theory are discussed, with particular emphasis on unresolved issues.

DISPOSITIONAL PREDICTION OF HUMAN BEHAVIOR

Much has been made of the fact that general dispositions tend to be poor predictors of behavior in specific situations. General attitudes have been assessed with respect to organizations and institutions (the church, public housing, student government, one's job or employer), minority groups (Blacks, Jews, Catholics), and particular individuals with whom a person might interact (a Black person, a fellow student). (See Ajzen & Fishbein, 1977, for a literature review.) The failure of such general attitudes to predict specific behaviors directed at the target of the attitude has produced calls for abandoning the attitude concept (Wicker, 1969).

In a similar fashion, the low empirical relations between general personality traits and behavior in specific situations has led theorists to claim that the trait concept, defined as a broad behavior disposition, is untenable (Mischel, 1968). Of particular interest for present purposes are attempts to relate generalized locus of control (Rotter, *1954,* 1966) to behaviors in specific contexts. As with other personality traits, the results have been disappointing. For example, perceived locus of control, as assessed by Rotter's scale, often fails to predict achievement-related behavior (see Warehime, 1972) or political involvement (see Levenson, 1981) in a systematic fashion; and somewhat more specialized measures, such as health-locus of control and achievement-related locus of control, have not fared much better (see Lefcourt, 1982; Wallston & Wallston, 1981).

One proposed remedy for the poor predictive validity of attitudes and traits is the *aggregation* of specific behaviors across occasions, situaions, and forms of action (Epstein, 1983; Fishbein & Ajzen, 1974). The idea behind the principle of aggregation is the assumption that any single ample of behavior reflects not only the influence of a relevant general disposition but also the influence of various other factors unique to the particular occasion, situation, and action being observed. By aggregating different behaviors, observed on different occasions and in different situations, these other sources of influence tend to cancel each other, with the result that the aggregate represents a more valid measure of the underlying behavioral disposition than any single behavior. Many studies

performed in recent years have demonstrated the workings of the aggregation principle by showing that general attitudes and personality traits do in fact predict behavioral aggregates much better than they predict specific behaviors. (See Ajzen, 1988, for a discussion of the aggregation principle and for a review of empirical research.)

ACCOUNTING FOR ACTIONS IN SPECIFIC CONTEXTS: THE THEORY OF PLANNED BEHAVIOR

The principle of aggregation, however, does not explain behavioral variability across situations, nor does it permit prediction of a specific behavior in a given situation. It was meant to demonstrate that general attitudes and personality traits *are* implicated in human behavior, but that their influence can be discerned only by looking at broad, aggregated, valid samples of behavior. Their influence on specific actions in specific situations is greatly attenuated by the presence of other, more immediate factors. Indeed, it may be argued that broad attitudes and personality traits have an impact on specific behaviors only indirectly by influencing some of the factors that are more closely linked to the behavior in question (see Ajzen & Fishbein, 1980, Chap. 7). The present article deals with the nature of these behavior-specific factors in the framework of the theory of planned behavior, a theory designed to predict and explain human behavior in specific contexts. Because the theory of planned behavior is described elsewhere (Ajzen, 1988), only brief summaries of its various aspects are presented here. Relevant empirical findings are considered as each aspect of the theory is discussed.

Predicting Behavior: Intentions and Perceived Behavioral Control

The theory of planned behavior is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) made necessary by the original model's limitations in dealing with behaviors over which people have incomplete volitional control. Figure 1 depicts the theory in the form of a structural diagram. For ease of presentation, possible feedback effects of behavior on the antecedent variables are not shown.

As in the original theory of reasoned action, a central factor in the theory of planned behavior is the individual's *intention* to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e.,
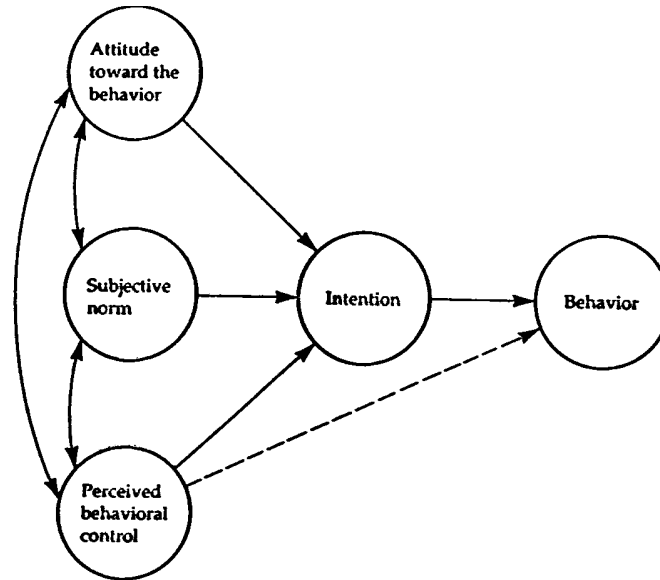
FIG. 1. Theory of planned behavior

if the person can decide at will to perform or not perform the behavior. Although some behaviors may in fact meet this requirement quite well, the performance of most depends at least to some degree on such non-motivational factors as availability of requisite opportunities and resources (e.g., time, money, skills, cooperation of others; see Ajzen, 1985, for a discussion). Collectively, these factors represent people's *actual* control over the behavior. To the extent that a person has the required opportunities and resources, and intends to perform the behavior, he or she should succeed in doing so.[1]

The idea that behavioral achievement depends jointly on motivation (intention) and ability (behavioral control) is by no means new. It constitutes the basis for theorizing on such diverse issues as animal learning (Hull, 1943), level of aspiration (Lewin, Dembo, Festinger, & Sears,

[1]The original derivation of the theory of planned behavior (Aizen, 1985) defined intention (and its other theoretical constructs) in terms of *trying* to perform a given behavior rather than in relation to actual performance. However, early work with the model showed strong correlations between measures of the model's variables that asked about trying to perform a given behavior and measures that dealt with actual performance of the behavior (Schifter & Ajzen, 1985; Ajzen & Madden, 1986). Since the latter measures are less cumbersome, they have been used in subsequent research, and the variables are now defined more simply in relation to behavioral performance. See, however, Bagozzi and Warshaw (1990, in press) for work on the concept of trying to attain a behavioral goal.

1944), performance on psychomotor and cognitive tasks (e.g., Pleishman, 1958; Locke, 1965; Vroom, 1964), and person perception and attribution (e.g., Heider, 1944; Anderson, 1974). It has similarly been suggested that some conception of behavioral control be included in our more general models of human behavior, conceptions in the form of "facilitating Factors" (Triandis, 1977), "the context of opportunity" (Sarver, 1983), 'resources" (Liska, 1984), or "action control" (KuhI, *1985).* The assumption is usually made that motivation and ability interact in their effects on behavioral achievement. Thus, intentions would be expected to influence performance to the extent that the person has behavioral control, and performance should increase with behavioral control to the extent that the person is motivated to try. Interestingly, despite its intuitive plausibility, the interaction hypothesis has received only limited empirical support (see Locke, Mento, & Katcher, 1978). We will return to this issue below.

Perceived behavioral control. The importance of *actual* behavioral control is self evident: The resources and opportunities available to a person must to some extent dictate the likelihood of behavioral achievement. Of greater psychological interest than actual control, however, is the *perception* of behavioral control and is impact on intentions and actions. Perceived behavioral control plays an important part in the theory of planned behavior. In fact, the theory of planned behavior differs from the theory of reasoned action in its addition of perceived behavioral control.

Before considering the place of perceived behavioral control in the prediction of intentions and actions, it is instructive to compare this construct to other conceptions of control. Importantly, perceived behavioral control differs greatly from Rotter's (1966) concept of perceived locus of control. Consistent with an emphasis on factors that are directly linked to a particular behavior, perceived behavioral control refers to people's perception of the ease or difficulty of performing the behavior of interest. Whereas locus of control is a generalized expectancy that remains stable across situations and forms of action, perceived behavioral control can, and usually does, vary across situations and actions. Thus, a person may believe that, in general, her outcomes are determined by her own behavior (internal locus of control), yet at the same time she may also believe that her chances of becoming a commercial airplane pilot are very slim (low perceived behavioral control).

Another approach to perceived control can be found in Atkinson's (1964) theory of achievement motivation. An important factor in this theory is the expectancy of success, defined as the perceived probability of succeeding at a given task. Clearly, this view is quite similar to perceived behavioral control in that it refers to a specific behavioral context and not to a generalized predisposition. Somewhat paradoxically, the *motive* to

achieve success is defined not as a motive to succeed at a given task but in terms of a general disposition "which the individual carries about him from one situation to another" (Atkinson, 1964, p. 242). This general achievement motivation was assumed to combine multiplicatively with the situational expectancy of success as well as with another situation-specific factor, the "incentive value" of success.

The present view of perceived behavioral control, however, is most compatible with Bandura's (1977, 1982) concept of perceived self-efficacy which "is concerned with judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122). Much of our knowledge about the role of perceived behavioral control comes from the systematic research program of Bandura and his associates (e.g., Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980). These investigations have shown that people's behavior is strongly influenced by their confidence in their ability to perform it (i.e., by perceived behavioral control). Self-efficacy beliefs can influence choice of activities, preparation for an activity, effort expended during performance, as well as thought patterns and emotional reactions (see Bandura, 1982, 1991). The theory of planned behavior places the construct of self-efficacy belief or perceived behavioral control within a more general framework of the relations among beliefs, attitudes, intentions, and behavior.

According to the theory of planned behavior, perceived behavioral control, together with behavioral intention, can be used directly to predict behavioral achievement. At least two rationales can be offered for this hypothesis. First, holding intention constant, the effort expended to bring a course of behavior to a successful conclusion is likely to increase with perceived behavioral control. For instance, even if two individuals have equally strong intentions to learn to ski, and both try to do so, the person who is confident that he can master this activity is more likely to persevere than is the person who doubts his ability.[2] The second reason for expecting a direct link between perceived behavioral control and behavioral achievement is that perceived behavioral control can often be used as a substitute for a measure of actual control. Whether a measure of perceived behavioral control can substitute for a measure of actual control depends, of course, on the accuracy of the perceptions. Perceived behavioral control may not be particularly realistic when a person has

[2] It may appear that the individual with high perceived behavioral control should also have a stronger intention to learn skiing than the individual with low perceived control. However, as we shall see below, intentions are influenced by additional factors, and it is because of these other factors that two individuals with different perceptions of behavioral control can have equally strong intentions.

relatively little information about the behavior, when requirements or available resources have changed, or when new and unfamiliar elements have entered into the situation. Under those conditions, a measure of perceived behavioral control may add little to accuracy of behavioral prediction. However, to the extent that perceived control is realistic, it can be used to predict the probability of a successful behavioral attempt (Ajzen, 1985).

Predicting Behavior: Empirical Findings

According to the theory of planned behavior, performance of a behavior is a joint function of intentions and perceived behavioral control. For accurate prediction, several conditions have to be met. First, the measures of intention and of perceived behavioral control must correspond to (Ajzen & Fishbein, 1977) or be compatible with (Ajzen, 1988) the behavior that is to be predicted. That is, intentions and perceptions of control must be assessed in relation to the particular behavior of interest, and the specified context must be the same as that in which the behavior is to occur. For example, if the behavior to be predicted is “donating money to the Red Cross,” then we must assess intentions “to donate money to the Red Cross” (not intentions “to donate money” in general nor intentions “to help the Red Cross”), as well as perceived control over “donating money to the Red Cross.” The second condition for accurate behavioral prediction is that intentions and perceived behavioral control must remain stable in the interval between their assessment and observation of the behavior. Intervening events may produce changes in intentions or in perceptions of behavioral control, with the effect that the original measures of these variables no longer permit accurate prediction of behavior. The third requirement for predictive validity has to do with the accuracy of perceived behavioral control. As noted earlier, prediction of behavior from perceived behavioral control should improve to the extent that perceptions of behavioral control realistically reflect actual control.

The relative importance of intentions and perceived behavioral control in the prediction of behavior is expected to vary across situations and across different behaviors. When the behavior/situation affords a person complete control over behavioral performance, intentions alone should be sufficient to predict behavior, as specified in the theory of reasoned action. The addition of perceived behavioral control should become increasingly useful as volitional control over the behavior declines. Both, intentions and perceptions of behavioral control, can make significant contributions to the prediction of behavior, but in any given application, one may be more important than the other and, in fact, only one of the two predictors may be needed.

Intentions and behavior. Evidence concerning the relation between

intentions and actions has been collected with respect to many different types of behaviors, with much of the work done in the framework of the theory of reasoned action. Reviews of this research can be found in a variety of sources (e.g., Ajzen, 1988; Ajzen & Fishbein, 1980; Canary & Seibold, 1984; Sheppard, Hartwick, & Warshaw, 1988). The behaviors involved have ranged from very simple strategy choices in laboratory games to actions of appreciable personal or social significance, such as having an abortion, smoking marijuana, and choosing among candidates in an election. As a general rule it is found that when behaviors pose no serious problems of control, they can be predicted from intentions with considerable accuracy (see Ajzen, 1988; Sheppard, Hartwick, & Warshaw, 1988). Good examples can be found in behaviors that involve a choice among available alternatives. For example, people's voting intentions, assessed a short time prior to a presidential election, tend to correlate with actual voting choice in the range of *.75* to .80 (see Fishbein & Ajzen, 1981). A different decision is at issue in a mother's choice of feeding method (breast versus bottle) for her newborn baby. This choice was found to have a correlation of .82 with intentions expressed several weeks prior to delivery (Manstead, Proffitt, & Smart, 1983).

Perceived behavioral control and behavior. In this article, however, we focus on situations in which it may be necessary to go beyond totally controllable aspects of human behavior. We thus turn to research conducted in the framework of the theory of planned behavior, research that has tried to predict behavior by combining intentions and perceived behavioral control. Table 1 summarizes the results of several recent studies that have dealt with a great variety of activities, from playing video games and losing weight to cheating, shoplifting, and lying.

Looking at the first four columns of data, it can be seen that both predictors, intentions and perceived behavioral control, correlate quite well with behavioral performance. The regression coefficients show that in the first five studies, each of the two antecedent variables made a significant contribution to the prediction of behavior. In most of the remaining studies, intentions proved the more important of the two predictors; only in the case of weight loss (Netemeyer, Burton, & Johnston, 1990; Schifter & Ajzen, 1985) did perceived behavioral control overshadow the contribution of intention.

The overall predictive validity of the theory of planned behavior is shown by the multiple correlations in the last column of Table 1. It can be seen that the combination of intentions and perceived behavioral control

[3]Intention–behavior correlations are, of course, not always as high as this. Lower correlations can be the result of unreliable or invalid measures (see Sheppard. Hartwick, & Warshaw, 1988) or, as we shall see below, due to problems of volitional control.

TABLE 1
PREDICTION OF BEHAVIOR (B) FROM INTENTION (I) AND PERCEIVED BEHAVIORAL CONTROL (PBC)

		Correlations		Regression coefficients		
Study	Activity	*I*	*PBC*	*I*	*PBC*	*R*
van Ryn & Vinokur (1990)	Job search, 10-activity index					
	1-month behavior post-test[a]	.41	.20	.38	.13	.42
Doll & Ajzen (1990)	Playing six video games					
	Mean within-subjects	.49	.48	.14	.12	.51
Schlegel et al. (1990)	Problem drinking — frequency	.47	.48	.28	.32	.53
	— quantity	.41	.60	.29	.43	.64
Ajzen & Driver (in press, a)	Five leisure activities					
	Mean within-subjects	.75	.73	.46	.37	.78
Locke et al. (1984)[b]	Performance on cognitive task[a]	.57	.61	.34	.42	.66
Watters (1989)	Election participation	.45	.31	.39	.19	.49
	Voting choice	.84	.76	.80	.05*	.84
Netemeyer, Burton, & Johnston	Election participation[a]	.41	.15	.52	.18*	.43
(1990)	Losing weight[a]	.18	.22	.08*	.18	.23
Schifter & Ajzen (1985)						
Madden, Ellen, & Ajzen (in	Losing weight	.25	.41	.09*	.39	.44
press)	10 common activities					
Ajzen & Madden (1986)	Mean within-subjects	.38	.28	.34	.17	.42
	Attending class	.36	.28	.30	.11*	.37
	Getting an 'A' in a course					
	Beginning of semester	.26	.11*	.26	– .01*	.26
	End of semester	.39	.38	.27	.26	.45
Beck & Ajzen (in press)	CCheating, shoplifting, lying—mean	.52	.44	.46	.08*	.53
Netemeyer. Andrews, &	GGiving a gift — mean					
Durvasula (1990)	over five items	.52	.24	.52	.02*	.53

* Not significant; all other coefficients significant at $p < .05$.
[a] Not a direct test of the theory of planned behavior.
[b] Secondary analysis.

permitted significant prediction of behavior in each case, and that many of the multiple correlations were of substantial magnitude. The multiple correlations ranged from .20 to .78, with an average of *.51.* Interestingly, the weakest predictions were found with respect to losing weight and getting an 'A' in a course. Of all the behaviors considered, these two would seem to be the most problematic in terms of volitional control, and in terms of the correspondence between perceived and actual control. Some confirmation of this speculation can be found in the study on academic performance (Ajzen & Madden, 1986) in which the predictive validity of perceived behavioral control improved from the beginning to the end of the semester, presumably because perceptions of ability to get an 'A' in the course became more realistic.

Another interesting pattern of results occurred with respect to political behavior. Voting choice in the 1988 presidential election (among respondents who participated in the election) was highly consistent ($r = .84$) with previously expressed intentions (Watters, 1989). Voting choice, of course, poses no problems in terms of volitional control, and perceptions

of behavioral control were found to be largely irrelevant. In contrast, participating in an election can be subject to problems of control even if only registered voters are considered: lack of transportation, being ill, and other unforeseen events can make participation in an election relatively difficult. In Watters's (1989) study of the 1988 presidential election, perceived behavioral control indeed had a significant regression coefficient, although this was not found to be the case in a study of participation in a gubernatorial election primary (Netemeyer *et a!.,* 1990).

Intention x control interaction. We noted earlier that past theory as well as intuition would lead us to expect an interaction between motivation and control. In the context of the theory of planned behavior, this expectation implies that intentions and perceptions of behavioral control should interact in the prediction of behavior. Seven of the studies shown in Table I included tests of this hypothesis (Doll & Ajzen, 1990; Ajzen & Driver, in press, a; Watters, 1989; Schifter & Ajzen, 1985; Ajzen & Madden, 1986; Beck & Ajzen, 1990). Of these studies, only one (Schifter & Ajzen, 1985) obtained a marginally significant ($p < .10$) linear x linear interaction between intentions to lose weight and perceptions of control over this behavioral goal. In the remaining six studies there was no evidence for an interaction of this kind. It is not clear why significant interactions failed to emerge in these studies, but it is worth noting that linear models are generally found to account quite well for psychological data, even when the data set is known to have been generated by a multiplicative model (Birnbaum, 1972; Busemeyer & Jones, 1983).

Predicting Intentions: Attitudes, Subjective Norms, and Perceived Behavioral Control

The theory of planned behavior postulates three conceptually independent determinants of intention. The first is the *attitude toward the behavior* and refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. The second predictor is a social factor termed *subjective norm;* it refers to the perceived social pressure to perform or not to perform the behavior. The third antecedent of intention is the degree of *perceived behavioral control* which, as we saw earlier, refers to the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles. As a general rule, the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior under consideration. The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviors and situations. Thus, in some applications it may be found that

only attitudes have a significant impact on intentions, in others that attitudes and perceived behavioral control are sufficient to account for intentions, and in still others that all three predictors make independent contributions.

Predicting Intentions: Empirical Findings

A number of investigators have begun to rely on the theory of planned behavior in their attempts to predict and understand people's intentions to engage in various activities. Table 2 summarizes the results of 16 studies that have been conducted in the past 5 years. Some of these studies were already mentioned earlier in the context of predicting behavior from intentions and perceptions of control (see Table 1); the added investigations in Table 2 assessed attitudes, subjective norms, perceived behavioral control, and intentions, but they contained no measure of behavior.

Inspection of the last column in Table 2 reveals that a considerable amount of variance in intentions can be accounted for by the three predictors in the theory of planned behavior. The multiple correlations ranged from a low of .43 to a high of .94, with an average correlation of .71. Equally important, the addition of perceived behavioral control to the model led to considerable improvements in the prediction of intentions; the regression coefficients of perceived behavioral control were significant in every study. Note also that, with only one exception, attitudes toward the various behaviors made significant contributions to the prediction of intentions, whereas the results for subjective norms were mixed, with no clearly discernible pattern. This finding suggests that, for the behaviors considered, personal considerations tended to overshadow the influence of perceived social pressure.

THE ROLE OF BELIEFS IN HUMAN BEHAVIOR

True to its goal of *explaining* human behavior, not merely predicting it, the theory of planned behavior deals with the antecedents of attitudes, subjective norms, and perceived behavioral control, antecedents which in the final analysis determine intentions and actions. At the most basic level of explanation, the theory postulates that behavior is a function of salient information, or beliefs, relevant to the behavior. People can hold a great many beliefs about any given behavior, but they can attend to only a relatively small number at any given moment (see Milier, 1956). It is these *salient* beliefs that are considered to be the prevailing determinants of a person's intentions and actions. Three kinds of salient beliefs are distinguished: *behavioral beliefs* which are assumed to influence attitudes toward the behavior, *normative beliefs* which constitute the underlying determinants of subjective norms, and *control beliefs* which provide the basis for perceptions of behavioral control.

TABLE 2

PREDICTION OF INTENTION (I) FROM ATTITUDE TOWARD THE BEHAVIOR (A5B), SUBJECTIVE NORM (SN), AND PERCEIVED BEHAVIORAL CONTROL (PBC)

		Correlations			Regression coefficients			
Study	Intention	A_B	SN	PBC	A_B	SN	PBC	R
van Ryn & Vinokur (1990)	Search for a job[a]	.63	.55	.20	.48	.35	.07	.71
Doil & Ajzen (1990)	Play six video games							
	Mean within-subjects	.92	.54	.87	.46	.17	.43	.94
Schlegel eta). (1990)	Get drunk[a]	.63	.41	.58	.41	.15	.36	.72
Aizen & Driver (in press, a)	Five leisure intentions							
	Mean within-subjects	.59	.70	.80	.28	.09*	.62	.85
Watters (1989)	Participate in election[a]	.39	.13*	.30	.32	.03*	.20	.43
	Voting choice	.91	.67	.89	.54	.06*	.39	.94
Netemeyer, Burton,	Participate in elections	.33	.34	.62	.10*	.10*	.54	.64
& Johnston (1990)	Lose weigh[a]	.33	.14	.31	.24	– .02	.47	.56
Schifter & Ajzen (1985)	Lose weight	.62	.44	.36	.79	.17	.30	.74
Madden, Ellen, & Aizen	10 common activities							
(in press)	Mean within-subjects	.52	.36	.37	.43	.22	.26	.63
Aizen & Madden (1986)	Attend class	.51	.35	.57	.32	.36	.44	.68
	Get an A' in a course[b]	.48	.11*	.44	.50	–.09*	.45	.65
Beck & Ajzen (in press)	Cheat, shoplift, lie							
	Mean	.68	.40	.77	.29	.05*	.59	.81
Netemeyer, Andrews,	Give a gift							
& Durvasula (1990)	Mean over five items[a]	.51	.38	.44	.36	.08*	.20	.56
Parker et al. (1990)	Commit traffic violations							
	Mean over four violations[a]	.26	.48	.44	.15	.28	.33	.60
Beale & Manstead (1991)	Limit infants' sugar intake[c]	.43	.33	.52	.26	.16*	.40	.60
Godin, Vezina, & Leclerc								
(1989)	Exercise after giving birth[a]	.50	– .01*	.60	.76	– .24	.84	.94
Godin et al. (3990)	Exercise after coronary[a]	.42	.13*	.50	.25	.01*	.39	.55
Otis, Godin, & Lambert								
(in press)	Use condoms[a]	.62	.42	.29	.52	.26	.17	.69

* Not significant; all other coefficient's significant at $p < .05$.

[a] Secondary analysis.

[b] Beginning of semester.

[c] Control group, second interview.

Behavioral Beliefs and Attitudes toward Behaviors

Most contemporary social psychologists take a cognitive or information-processing approach to attitude formation. This approach is exemplified by Fishbein and Ajzen's *(1975)* expectancy-value model of attitudes. According to this model, attitudes develop reasonably from the beliefs people hold about the object of the attitude. Generally speaking, we form beliefs about an object by associating it with certain attributes, i.e., with other objects, characteristics, or events. In the case of attitudes toward a behavior, each belief links the behavior to a certain outcome, or to some other attribute such as the cost incurred by performing the behavior. Since the attributes that come to be linked to the behavior are already valued positively or negatively, we automatically and simultaneously acquire an attitude toward the behavior. In this fashion, we learn to favor behaviors we believe have largely desirable consequences and we form unfavorable attitudes toward behaviors we associate with mostly undesirable consequences. Specifically, the outcome's subjective value contributes to the attitude in direct proportion to the strength of the belief, i.e., the subjective

$$A \propto \sum b_i e_i \qquad (1)$$

probability that the behavior will produce the outcome in question. As shown in Eq. (1), the strength of each salient belief *(b)* is combined in a multiplicative fashion with the subjective evaluation *(e)* of the belief's attribute, and the resulting products are summed over the *n* salient beliefs. A person's attitude *(A)* is directly proportional (∝) to this summative belief index.

We can explore an attitude's informational foundation by eliciting salient beliefs about the attitude object and assessing the subjective probabilities and values associated with the different beliefs. In addition, by combining the observed values in accordance with Eq. (1), we obtain an estimate of the attitude itself, an estimate that represents the respondent's evaluation of the object or behavior under consideration. Since this estimate is based on salient beliefs about the attitude object, it may be termed a belief-based measure of attitude. If the expectancy-value model specified in Eq. (1) is valid, the belief-based measure of attitude should correlate well with a standard measure of the same attitude.

A great number of studies have, over the years, tested the general expectancy-value model of attitude as well as its application to behavior. In a typical study, a standard, global measure of attitude is obtained, usually by means of an evaluative semantic differential, and this standard

measure is then correlated with an estimate of the same attitude based on salient beliefs (e.g., Ajzen, 1974; Fishbein, 1963, Fishbein & Ajzen, 1981; Jaccard & Davidson, 1972; Godin & Shephard, 1987; Insko, Blake, Cialdini, & Mulaik, 1970; Rosenberg, *1956).* The results have generally supported the hypothesized relation between salient beliefs and attitudes, although the magnitude of this relation has sometimes been disappointing.

Various factors may be responsible for relatively low correlations between salient beliefs and attitudes. First, of course, there is the possibility that the expectancy-value model is an inadequate description of the way attitudes are formed and structured. For example, some investigators (e.g., Valiquette, Valois, Desharnais, & Godin, 1988) have questioned the multiplicative combination of beliefs and evaluations in the expectancy-value model of attitude. Most discussions of the model, however, have focused on methodological issues.

Belief salience. It is not always recognized that the expectancy-value model of attitude embodied in the theories of reasoned action and planned behavior postulates a relation between a person's *salient* beliefs about the behavior and his or her attitude toward that behavior. These salient beliefs must be elicited from the respondents themselves, or in pilot work from a sample of respondents that is representative of the research population. An arbitrarily or intuitively selected set of belief statements will tend to include many associations to the behavior that are not salient in the population, and a measure of attitude based on responses to such statements need not correlate highly with a standard measure of the attitude in question. Generally speaking, results of empirical investigations suggest that when attitudes are estimated on the basis of salient beliefs, correlations with a standard measure tend to be higher than when they are estimated on the basis of an intuitively selected set of beliefs (see Fishbein & Ajzen, 1975, Chap. 6, for a discussion). Nevertheless, as we will see below, correlations between standard and belief-based measures are sometimes of only moderate magnitude even when salient beliefs are used.

Optimal scaling. A methodological issue of considerable importance that has not received sufficient attention has to do with the scaling of belief and evaluation items. In most applications of the theory of planned behavior, belief strength is assessed by means of a 7-point graphic scale (e.g., *likely–unlikely)* and evaluation by means of a 7-point evaluative scale (e.g., *good–bad).* There is nothing in the theory, however, to inform us whether responses to these scales should be scored in a *unipolar* fashion (e.g., from 1 to 7, or from 0 to 6) or in a *bipolar* fashion (e.g., from -3 to + 3). Belief strength *(b)* is defined as the subjective probability that a given behavior will produce a certain outcome (see Fishbein & Ajzen, 1975). In light of this definition, it would seem reasonable to subject the

measure of belief strength to unipolar scoring, analogous to the 0-to-1 scale of objective probabilities. In contrast, evaluations *(e),* like attitudes, are usually assumed to form a bipolar continuum, from a negative evaluation on one end to a positive evaluation on the other (see Pratkanis, 1989, for a discussion of unipolar versus bipolar attitude structures).

From a measurement perspective, however, either type of scoring could be applied with equal justification. Rating scales of the kind used in research on the expectancy-value model can at best be assumed to meet the requirements of equal-interval measures. As such, it is permissible to apply any linear transformation to the respondents' ratings without altering the measure's scale properties (see, e.g., Dawes, 1972). Going from a bipolar to a unipolar scale, or vice versa, is of course a simple linear transformation in which we add or subtract a constant from the obtained values.[4]

There is thus no rational a priori criterion we can use to decide how the belief and evaluation scales should be scored (cf., Schmidt, 1973). A relatively easy solution to this problem was suggested by Holbrook (1977; see also Orth, 1985). Let *B* represent the constant to be added or subtracted in the rescaling of belief strength, and *E* the constant to be added or subtracted in the rescaling of outcome evaluations. The expectancy-value model shown in Eq. (1) can then be rewritten as

$$A \propto \sum (b_i + B)(e_i + E).$$

Expanded, this becomes

$$A \propto \sum b_i e_i + B \sum e_i + E \sum b_i + BE$$

and, disregarding the constant *BE,* we can write

$$A \propto \sum b_i e_i + B \sum e_i + E \sum b_{i.}$$

To estimate the rescaling parameters *B* and *E,* we regress the standard attitude measure, which serves as the criterion, on $\sum b_i e_i$, $\sum b_i$, and $\sum e_i$, and then divide the unstandardized regression coefficients of $\sum b_i$ and $\sum e_i$ by the coefficient obtained for $\sum b_i e_i$. The resulting value for the coefficient of $\sum e_i$ provides a least-squares estimate of *B*, the rescaling constant for belief strength, and the value for the coefficient of $\sum b_i$ serves as a least-squares estimate of *E,* the rescaling constant for outcome evaluation.

[4]Note, however, that a linear transformation of *b* or *e* results *in a nonlinear* transformation of the *b* x *e* product term.

An empirical illustration. To illustrate the use of optimal rescaling coefficients, we turn to a recent study on leisure behavior (Ajzen & Driver, in press, b). In this study, college students completed a questionnaire concerning five different leisure activities: spending time at the beach, outdoor jogging or running, mountain climbing, boating, and biking. A standard semantic differential scale was used to assess global evaluations of each activity. For the belief-based attitude measures, pilot subjects had been asked to list costs and benefits of each leisure activity. The most frequently mentioned beliefs were retained for the main study. With respect to spending time at the beach, for example, the salient beliefs included such costs and benefits as *developing skin cancer* and *meeting people of the opposite sex.*

The first column in Table 3 provides baseline correlations between the semantic differential and the belief-based attitude measures for the case of scoring b from ito 7 and e from —3 to + 3. The correlations in the second column were obtained when b and e were both scaled in a bipolar fashion. The third column presents the correlations that are obtained after optimal rescaling, and the last two columns contain the optimal rescaling parameters B and E for the case of unipolar belief strength and bipolar evaluation. Note first that bipolar scoring of belief strength (in addition to bipolar scoring of evaluations) produced stronger correlations with the global attitude measure than did unipolar scoring of beliefs. Inspection of the rescaling constants similarly shows the need to move to bipolar scoring of belief strength, and to leave intact the bipolar scoring of evalua-

TABLE 3
EFFECT OF OPTIMAL RESCALING OF BELIEF STRENGTH AND OUTCOME EVALUATION ON THE RELATION BETWEEN BELIEFS AND ATTITUDES

	$A - \sum b_i e_i$ correlations				
	b: unipolar e: bipolar	*b: bipolar e: bipolar*	After optimal rescaling	Rescaling constants B	E
Spending time at the beach	.06*	.54	.57	− .70	.26
Outdoor jogging or running	.34	.35	.41	− .43	1.02
Mountain climbing	.25	.51	.51	− 4.22	.15
Boating	.24	.44	.45	− 4.43	.12
Biking	.09*	.35	.37	− .81	.38

Note. A = semantic differential measure of attitude, *Xb1e1* belief-based measure of attitude, *b* = belief strength, *e* = outcome evaluation, *B* = optimal rescaling constant for belief strength, *E* = optimal rescaling constant for outcome evaluation.

* Not significant; all other correlations $p < .05$.

tions. These findings are consistent with the usual practice of scoring both belief strength and attribute evaluations in a bipolar fashion (see Ajzen & Fishbein, 1980). In fact, applying the optimal rescaling constants greatly improved the correlations when the original belief strength was unipolar, but rarely raised the correlations above the level obtained with bipolar scoring of beliefs. It is worth noting, however, that even with optimally rescaled belief and evaluation measures, the correlations between the semantic differential and the belief-based estimates of attitude were of only moderate magnitude. The expectancy model was, at best, able to explain between 10 and 36% of the variance in the standard attitude measures. This finding is quite consistent with other recent attempts to improve the correlation between global and belief-based measures of attitude by means of optimal rescaling of beliefs and evaluations (see Doll, Ajzen, & Madden, in press).

Normative Beliefs and Subjective Norms

Normative beliefs are concerned with the likelihood that important referent individuals or groups approve or disapprove of performing a given behavior. The strength of each normative belief *(n)* is multiplied by the person's motivation to comply *(in)* with the referent in question, and the subjective norm (SN) is directly proportional to the sum of the resulting products across the *n* salient referents, as in Eq. (2):

$$SN \propto \sum n_i m_i \qquad (2)$$

A global measure of SN is usually obtained by asking respondents to rate the extent to which "important others" would approve or disapprove of their performing a given behavior. Empirical investigations have shown that the best correspondence between such global measures of subjective norm and belief-based measures is usually obtained with bipolar scoring of normative beliefs and unipolar scoring of motivation to comply (Ajzen & Fishbein, 1980). With such scoring, correlations between belief-based and global estimates of subjective norm are generally in the range of .40 to .80, not unlike the findings with respect to attitudes (see, e.g., Ajzen & Madden, 1986; Fishbein & Ajzen, 1981; Otis, Godin, & Lambert, in press).

As an illustration we turn again to the study on leisure behavior (Ajzen & Driver, in press, b). The salient referents for the five leisure activities elicited in the pilot study were friends, parents, boyfriend/girlfriend, brothers/sisters, and other family members. With respect to each referent, respondents rated, on a 7-point scale, the degree to which the refer-

ent would approve or disapprove of their engaging in a given leisure activity. These normative beliefs were multiplied by motivation to comply with the referent, a rating of how much the respondents cared whether the referent approved or disapproved of their leisure activities.
The first row in Table 4 presents the correlations between the global and belief-based measures of subjective norm. It can be seen that, as in the case of attitudes, the correlations—although significant—were of only moderate magnitude. As is sometimes found to be the case (Ajzen & Fishbein, 1969, 1970), the motivation to comply measure did not add predictive power; in fact it tended to suppress the correlations. When motivation to comply was omitted, the sum of normative beliefs ($\sum n_i$) correlated with the global measure of subjective norm at a level close to the correlations obtained after optimal rescaling of the normative belief and motivation to comply ratings (see Rows 2 and 3 in Table 4).

Control Beliefs and Perceived Behavioral Control

Among the beliefs that ultimately determine intention and action there is, according to the theory of planned behavior, a set that deals with the presence or absence of requisite resources and opportunities. These control beliefs may be based in part on past experience with the behavior, but they will usually also be influenced by second-hand information about the behavior, by the experiences of acquaintances and friends, and by other factors that increase or reduce the perceived difficulty of performing the behavior in question. The more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behavior. Specifically, as shown in Eq. (3), each control belief *(c)* is multiplied by the perceived power (p) of the particular control factor to facilitate or inhibit performance of the behavior, and the resulting products are

TABLE 4
CORRELATIONS BETWEEN GLOBAL AND BELIEF-BASED MEASURES OF SUBJECTIVE NORM (SN) AND PERCEIVED BEHAVIORAL CONTROL (PBC)

	Leisure activity				
	Beach	Jogging	Mountain climbing	Boating	Biking
Global SN – $\sum n_i m_i$	.47	.60	.58	.47	.35
Global SN – $\sum n_i$	.60	.70	.65	.61	.50
After optimal rescaling	.61	.71	.65	.64	.52
Global PBC – $\sum p_i c_i$	.24	.46	.66	.70	.45
After optimal rescaling	.41	.65	.72	.73	.48

Note. SN = Global measure of subjective norm, $\sum n_i m_i$ = belief-based measure of subjective norm, $\sum n_i$ = belief-based measure of subjective norm without motivation to comply, PBC = global measure of perceived behavioral control, $\sum p_i c_i$ = belief-based measure of perceived behavioral control.

summed across the *n* salient control beliefs to produce the perception of behavioral control (PBC). Thus, just as beliefs concerning consequences of a behavior are viewed as determining attitudes toward the behavior, and normative beliefs are viewed as determining subjective norms, so beliefs about resources and opportunities are viewed as underlying perceived behavioral control.

$$PBC \propto \sum p_i c_i \tag{3}$$

As of today, only a handful of studies have examined the relation between specific control beliefs and perceived behavioral control (e.g., Ajzen & Madden, 1986). The last two rows in Table 4 present relevant data for the study on leisure activities (Ajzen & Driver, in press, b). Global assessments of the perceived ease or difficulty of engaging in each of the five leisure activities were correlated with belief-based measures of perceived behavioral control. With respect to outdoor running or jogging, for example, control factors included being in poor physical shape and living in an area with good jogging weather.

In computing the correlations in Row 4 of Table 4, bipolar scoring was used for control beliefs *(c)* as well as for the perceived power of the control factor under consideration (p). This scoring proved satisfactory for three of the five activities (mountain climbing, boating, and biking), as can be seen by comparing the correlations with and without optimal rescoring (Rows *5* and 4, respectively). With regards to spending time at the beach, the optimal scoring analysis indicated that the perceived power components would better be scored in a unipolar fashion; and with respect to outdoor jogging or running, unipolar scoring would have to be applied to both the ratings of control belief strength and the ratings of the perceived power of control factors.

In conclusion, inquiries into the role of beliefs as the foundation of attitude toward a behavior, subjective norm, and perceived behavioral control have been only partly successful. Most troubling are the generally moderate correlations between belief-based indices and other, more global measures of each variable, even when the components of the multiplicative terms are optimally rescored. Note that responding to the belief and valuation items may require more careful deliberations than does responding to the global rating scales. It is, therefore, possible that the global measures evoke a relatively automatic reaction whereas the belief-related items evoke a relatively reasoned response. Some evidence, not dealing directly with expectancy-value models, is available in a study on the prediction of intentions in the context of the theory of reasoned action

(Ellen & Madden, 19%). The study manipulated the degree to which respondents had to concentrate on their ratings of attitudes, subjective norms, and intentions with respect to a variety of different behaviors. This was done by presenting the questionnaire items organized by behavior or in random order, and by using a paper and pencil instrument versus a computer-administered format. The prediction of intentions from attitudes and subjective norms was better under conditions that required careful responding (random order of items, computer-administered) than in the comparison conditions.[5]

Our discussion of the relation between global and belief-based measures of attitudes is not meant to question the general idea that attitudes are influenced by beliefs about the attitude object. This idea is well supported, especially by experimental research in the area of persuasive communication: A persuasive message that attacks beliefs about an object is typically found to produce changes in attitudes toward the object (see McGuire, 1985; Petty & Cacioppo, 1986). By the same token, it is highly likely that persuasive communications directed at particular normative or control beliefs will influence subjective norms and perceived behavioral control. Rather than questioning the idea that beliefs have a causal effect on attitudes, subjective norms, and perceived behavioral control, the moderate correlations between global and belief-based measures suggest that the expectancy-value formulation may fail adequately to describe the process whereby individual beliefs combine to produce the global response. Efforts need to be directed toward developing alternative models that could be used better to describe the relations between beliefs on one hand and the global constructs on the other. In the pages below, we consider several other unresolved issues related to the theory of planned behavior.

THE SUFFICIENCY OF THE THEORY OF PLANNED BEHAVIOR

The theory of planned behavior distinguishes between three types of beliefs—behavioral, normative, and control—and between the related constructs of attitude, subjective norm, and perceived behavioral control. The necessity of these distinctions, especially the distinction between behavioral and normative beliefs (and between attitudes and subjective norms) has sometimes been questioned (e.g., Miniard & Cohen, 1981). It can reasonably be argued that all beliefs associate the behavior of interest with an attribute of some kind, be it an outcome, a normative expectation,

[5]Interestingly, this study failed to replicate the results of Budd's (1987) experiment in which randomization of items drastically reduced the correlations among the constructs in the theory of planned behavior. A recent study by van den Putte and Hoogstraten (1990) also failed to corroborate Budd's findings.

or a resource needed to perform the behavior. It should thus be possible to integrate all beliefs about a given behavior under a single summation to obtain a measure of the overall behavioral disposition.

The primary objection to such an approach is that it blurs distinctions that are of interest, both from a theoretical and from a practical point of view. Theoretically, personal evaluation of a behavior (attitude), socially expected mode of conduct (subjective norm), and self-efficacy with respect to the behavior (perceived behavioral control) are very different concepts each of which has an important place in social and behavioral research. Moreover, the large number of studies on the theory of reasoned action and on the theory of planned behavior have clearly established the utility of the distinctions by showing that the different constructs stand in predictable relations to intentions and behavior.[6]

Perhaps of greater importance is the possibility of making further distinctions among additional kinds of beliefs and related dispositions. The theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account. The theory of planned behavior in fact expanded the original theory of reasoned action by adding the concept of perceived behavioral control.

Personal or Moral Norms

It has sometimes been suggested that, at least in certain contexts, we need to consider not only perceived *social* pressures but also *personal* feelings of moral obligation or responsibility to perform, or refuse to perform, a certain behavior (Gorsuch & Ortberg, 1983; Pomazal & Jaccard, 1976; Schwartz & Tessler, 1972). Such moral obligations would be expected to influence intentions, in parallel with attitudes, subjective (social) norms and perceptions of behavioral control. In a recent study of college students (Beck & Ajzen, in press), we investigated this issue in the context of three unethical behaviors: cheating on a test or exam, shoplifting, and lying to get out of taking a test or turning in an assignment on time. It seemed reasonable to suggest that moral issues may take on added salience with respect to behaviors of this kind and that a measure of perceived moral obligation could add predictive power to the model.

Participants in the study completed a questionnaire that assessed the

[6]Of course, even as we accept the proposed distinctions, we can imagine other kinds of relations among the different theoretical constructs. For example, it has been suggested that, in certain situations, perceived behavioral control functions as a precursor to attitudes and subjective norms (van Ryn & Vinokur, 1990) or that attitudes not only influence intentions but also have a direct effect on behavior (Bentler & Speckart, 1979).

TABLE 5
PREDICTION OF UNETHICAL INTENTIONS

	Cheating			Shoplifting			Lying		
	r	*b*	*R*	*r*	*b*	*R*	*r*	*b*	*R*
Step I—Theory of planned behavior									
Attitude	.67	.28*		78	.44*		*.53*	.10	
Subjective norm	.34	–.02		.38	–.02		*.46*	.19*	
Perceived behavioral control	.79	.62*	.82	.79	.46*	.83	*.75*	.64*	79
Step 2—Moral obligation									
Attitude	.67	.21*		.78	.25*		*.53*	– .05	
Subjective norm	.34	–.08		.38	–.05		*.46*	.08	
Perceived behavioral control	.79	.52*		.79	.40		*.75*	.48*	
Perceived moral obligation	.69	.26*	.84	.75	.34*	.87	*.75*	.42*	.83

*Significant regression coefficient ($p < .05$).

constructs in the theory of planned behavior, as well as a three-item measure of perceived moral obligation to refrain from engaging in each of the behaviors. Results concerning the theory's ability to predict intentions, averaged across the three behaviors, were presented earlier in Table 2. Table *5* displays the results of hierarchical regression analyses in which the constructs of the theory of planned behavior were entered on the first step, followed on the second step by perceived moral obligation. It can be seen that although the multiple correlations in the first step were very high, addition of perceived moral obligation further increased the explained variance by 3 to 6%, making a significant contribution in the prediction of each intention.

Affect versus Evaluation

Just as it is possible to distinguish between different kinds of normative pressures, it is possible to distinguish between different kinds of attitudes. In developing the theory of reasoned action, no clear distinction was drawn between affective and evaluative responses to a behavior. Any general reaction that could be located along a dimension of favorability from negative to positive was considered an indication of attitude (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Some investigators, however, have suggested that it is useful to distinguish between "hot" and "cold" cognitions (Abelson, 1963) or between evaluative and affective judgments (Abelson, Kinder, Peters, & Fiske, 1982; Ajzen & Timko, 1986).[7] This

[7]In a related manner, Bagozzi (1986, 1989) has drawn a distinction between moral (good/ bad) and affective (pleasant/unpleasant) attitudes toward a behavior.

distinction was examined in the study on the leisure activities of college students mentioned earlier (Ajzen & Driver, in press, b).

In addition to the perceived costs and benefits of performing a given leisure activity (evaluative judgments), the study also assessed beliefs about positive or negative feelings derived from the activity (affective judgments). A questionnaire survey assessed evaluative and affective beliefs with respect to the five leisure activities: spending time at the beach, outdoor jogging or running, mountain climbing, boating, and biking. For example, with respect to spending time at the beach, beliefs of an evaluative nature included, as mentioned earlier, *developing skin cancer* and *meeting people of the opposite sex,* while among the beliefs of an affective nature were *feeling the heat and sun on your body* and *watching* and *listening to the ocean.* Consistent with the expectancy-value model of attitude, respondents rated the likelihood of each consequence as well as its subjective value, and the products of these ratings were summed over the set of salient beliefs of an evaluative nature and over the set of salient beliefs of an affective nature. In addition, the respondents were asked to rate each activity on a 12-item semantic differential containing a variety of evaluative (e.g., harmful—beneficial) and affective (e.g., pleasant—unpleasant) adjective pairs.

A factor analysis of the semantic differentials revealed the two expected factors, one evaluative and the other affective in tone. Of greater interest, the summative index of evaluative beliefs correlated with the evaluative, but not with the affective, semantic differential; and the sum over the affective beliefs correlated with the affective, but not with the evaluative, semantic differential. These results are shown in Table 6, which presents the average within-subjects correlations between semantic differential and belief-based attitude measures. (Evidence for the discriminant validity of the distinction between evaluation and affect was also reported by Breckler and Wiggins, 1989.)

Despite this evidence for the convergent and discriminant validities of the affective and evaluative measures of beliefs and attitudes, using the

TABLE 6
MEAN WITHIN-SUBJECTS CORRELATIONS BETWEEN EVALUATIVE AND AFFECTIVE MEASURES OF ATTITUDE TOWARD LEISURE BEHAVIOR

	$\sum b_i e_i$: Evaluation	$\sum b_i e_i$: Affect
SD: evaluation	.50*	.18
SD: affect	.03	.56*

Note. SD = semantic differential measure of attitude, $\sum b_i e_i$ = belief-based mueasure of attitude.

* $p < .01$.

two separate measures of attitude did not significantly improve prediction of leisure intentions. In Table 3 we saw that the within-subjects prediction of intentions from subjective norms, perceived behavioral control, and the total semantic differential measure of attitudes resulted in a multiple correlation of *.85.* When the evaluative and affective subscales of the semantic differential were entered separately, each made a significant contribution, but the multiple correlation was virtually unchanged (R = .86).

The Role of Past Behavior

The question of the model's sufficiency can be addressed at a more general level by considering the theoretical limits of predictive accuracy (see Beck & Ajzen, in press). If all factors—whether internal to the individual or external—that determine a given behavior are known, then the behavior can be predicted to the limit of measurement error. So long as this set of factors remains unchanged, the behavior also remains stable over time. The dictum, "past behavior is the best predictor of future behavior" will be realized when these conditions are met.

Under the assumption of stable determinants, a measure of past behavior can be used to test the sufficiency of any model designed to predict future behavior. A model that is sufficient contains all important variables in the set of determinants, and thus accounts for all non-error variance in the behavior. Addition of past behavior should not significantly improve the prediction of later behavior. Conversely, if past behavior is found to have a significant residual effect beyond the predictor variables contained in the model, it would suggest the presence of other factors that have not been accounted for. The only reservation that must be added is that measures of past and later behavior may have common error variance not shared by measures of the other variables in the model. This is particularly likely when behavior is observed while other variables are assessed by means of verbal self-reports, but it can also occur because self-reports of behavior are often elicited in a format that differs substantially from the remaining items in a questionnaire. We would thus often expect a small, but possibly significant, residual effect of past behavior even when the theoretical model is in fact sufficient to predict future behavior (see also Dillon & Kumar, 1985).[8]

Some investigators (e.g., Bentler & Speckart, 1979; Fredricks & Dossett, 1983) have suggested that past behavior be included as a substantive

[8]Dillon and Kumar (1985) pointed out that structural modeling techniques, such as LISREL, can be used to test this idea by permitting correlated errors between prior and later behavior. Most of the data presented in the present article could not be submitted to such analyses because of the absence of multiple indicators for the different constructs involved.

predictor of later behavior, equivalent to the other independent variables in the model. According to these theorists, prior behavior has an impact on later behavior that is independent of the effects of beliefs, attitudes, subjective norms, and intentions. Specifically, the assumption usually made is that repeated performance of a behavior results in the establishment of a *habit;* behavior at a later time then occurs at least in part habitually, without the mediation of attitudes, subjective norms, perceptions of control, or intentions. It must be realized, however, that although past behavior may well reflect the impact of factors that influence later behavior, it can usually not be considered a causal factor in its own right (see Ajzen, 1987). Nor can we simply assume that past behavior is a valid measure of habit; it may, and usually does, reflect the influence of many other internal and external factors. Only when habit is defined independently of (past) behavior can it legitimately be added as an explanatory variable to the theory of planned behavior. A measure of habit thus defined would presumably capture the residues of past behavior that have established a habit or tendency to perform the behavior on future occasions. Attitudes are, of course, such residues of past experience (cf., Campbell, 1963), as are subjective norms and perceived self-efficacy. The unique contribution of habit would lie in finding a residue of past experience that leads to habitual rather than reasoned responses.

In sum, past behavior is best treated not as a measure of habit but as a reflection of all factors that determine the behavior of interest. The correlation between past and later behavior is an indication of the behavior's stability or reliability, and it represents the ceiling for a theory's predictive validity. If an important factor is missing in the theory being tested, this would be indicated by a significant residual effect of past on later behavior. Such residual effects could reflect the influence of habit, if habit is not represented in the theory, but it could also be due to other factors that are missing.

A number of studies have examined the role of past behavior in the context of the theory of reasoned action. Although past behavior was in these studies treated as a measure of habit, their results can better be considered a test of the theory's sufficiency. Because intention is the only immediate precursor of behavior in the theory of reasoned action, the simplest test of the model's sufficiency is obtained by regressing later on past behavior after the effect of intention has been extracted. Bentler and Speckart (1979) were the first to look at the residual effect of past behavior in the context of the theory of reasoned action. Using structural modeling techniques, they showed that a model which includes a direct path from prior behavior to later behavior provided a significantly better fit to the data than did a model representing the theory of reasoned action in which the effect of past on later behavior is assumed to be mediated by

intention. Similar results were later reported by Bagozzi (1981) and by Fredricks and Dossett (l983).[9] (See also Bagozzi & Warshaw, 1990.)

The implication of these findings is that even though the theory of reasoned action accounted for considerable proportions of variance in behavior, it was not sufficient to explain all systematic variance. One possible reason, of course, is that this theory lacks the construct of perceived self-efficacy or behavioral control. Past experience with a behavior is the most important source of information about behavioral control (Bandura, 1986). It thus stands to reason that perceived behavioral control can play an important role in mediating the effect of past on later behavior.

Three of the studies mentioned in earlier discussions contain data of relevance to the mediation question (Ajzen & Driver, in press, a; Beck & Ajzen, in press; van Ryn & Vinokur, 1990). For each data set, behavior was regressed first on intentions and perceived behavioral control, followed on the second step by past behavior (B_0). The results are summarized in Table 7 where it can be seen that, with only one exception (shoplifting), past behavior retained a significant residual effect in the prediction of later behavior. In most instances, however, the residual effect seemed small enough to be attributable to method variance shared by the measures of prior and later behavior. This can be seen most clearly when comparing the last two columns of Table 7. In the study on leisure activities, adding prior behavior to the regression equation raised the multiple correlation from .78 to .86, a 13% increase in explained variance. The multiple correlation increased from .74 to .79 in the case of cheating, producing a *5%* boost in explained variance; it rose from *.35* to *.50* for the prediction of lying (a 13% increase in explained variance); and it remained unaffected by the introduction of past behavior in the case of shoplifting. By way of contrast, the remaining comparison shows that the introduction of past behavior produced an improvement in explained behavioral variance that is probably too large to be attributable to method variance. In the case of searching for ajob, the multiple correlation rose from .42 to .71, a 32% increase in explained variance.

It is premature, on the basis of such a limited set of studies, to try drawing definite conclusions about the sufficiency of the theory of planned behavior. Clearly, intentions and perceptions of behavioral control are useful predictors, but only additional research can determine whether these constructs are sufficient to account for all or most of the systematic variance in behavior.

[9] These studies also tested the theory's assumption that the effect of attitudes on behavior is mediated by intention, with rather inconclusive results. In a recent study, Bagozzi, Baumgartner, and Yi (1989) found that direct links between attitudes and behavior, unmediated by intention, may at least in part reflect methodological problems.

TABLE 7
PREDICTION OF LATER BEHAVIOR FROM INTENTION (I), PERCEIVED BEHAVIORAL CONTROL (PBC), AND PAST BEHAVIOR (B_0)

Study	Activity	Correlations			Regression coefficients			Multiple correlations	
		I	PBC	B_0	I	PBC	B_0	without B_0	with B_0
Ajzen & Driver (in press, a)	Five leisure activities								
	Mean within-subjects	.75	.73	.85	.20	.01*	.68	.78	.86[b]
Beck & Ajzen (in press)	Cheating	.74	.66	.74	.21	.21	.44	.74	.79[b]
	Lying	.35	.29	.47	.26	.19	.46	.35	.50[b]
	Shoplifting	.48	.38	.43	.49	.13*	.14*	.49	.49
van Ryn & Vinokur (1990)[a]	Job search index	.41	.20	.68	.21	.02*	.61	.42	.71[b]

* Not significant; all other coefficients significant at $p < .05$.
[a] Secondary analysis.
[b] The increase in explained variance is significant at $p < .05$.

CONCLUSIONS

In this article I have tried to show that the theory of planned behavior provides a useful conceptual framework for dealing with the complexities of human social behavior. The theory incorporates some of the central concepts in the social and behavior sciences, and it defines these concepts in a way that permits prediction and understanding of particular behaviors in specified contexts. Attitudes toward the behavior, subjective norms with respect to the behavior, and perceived control over the behavior are usually found to predict behavioral intentions with a high degree of accuracy. In turn, these intentions, in combination with perceived behavioral control, can account for a considerable proportion of variance in behavior.

At the same time, there are still many issues that remain unresolved. The theory of planned behavior traces attitudes, subjective norms, and perceived behavioral control to an underlying foundation of beliefs about the behavior. Although there is plenty of evidence for significant relations between behavioral beliefs and attitudes toward the behavior, between normative beliefs and subjective norms, and between control beliefs and perceptions of behavioral control, the exact form of these relations is still uncertain. The most widely accepted view, which describes the nature of the relations in terms of expectancy-value models, has received some support, but there is clearly much room for improvement. Of particular concern are correlations of only moderate magnitude that are frequently observed in attempts to relate belief-based measures of the theory's constructs to other, more global measures of these constructs. Optimally rescaling measures of belief strength, outcome evaluation, motivation to comply, and the perceived power of control factors can help overcome scaling limitations, but the observed gain in correlations between global and belief-based measures is insufficient to deal with the problem.

From a general view, however, application of the theory of planned behavior to a particular area of interest, be it problem drinking (Schiegel, d'Avernas, Zanna, DeCourville, & Manske, 1990), leisure behavior (Ajzen & Driver, in press, a,b), or condom use (Otis, Godin, & Lambert, in press), provides a host of information that is extremely useful in any attempt to understand these behaviors, or to implement interventions that will be effective in changing them (Van Ryn & Vinokur, 1990). Intention, perception of behavioral control, attitude toward the behavior, and subjective norm each reveals a different aspect of the behavior, and each can serve as a point of attack in attempts to change it. The underlying foundation of beliefs provides the detailed descriptions needed to gain substantive information about a behavior's determinants. It is at the level of beliefs that we can learn about the unique factors that induce one person

to engage in the behavior of interest and to prompt another to follow a different course of action.

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